

WHAT IS CLAIMED IS:

1. A turbomachine comprising:

(a) a mounted first shaft having a first overhanging end and a second opposite end having a first shaft coupling element;

(b) a rotor disk connected to said first overhanging end;

(c) a rotatably mounted second shaft aligned with said first shaft and having a second shaft coupling element; and

(d) an electric machine having an electric rotor arranged between said first shaft and said second shaft, said electric rotor being connected by a first coupling to said second end of said first shaft opposite to said rotor disk and by a second coupling to said second shaft, said electric rotor serving as a coupling intermediate piece arranged without separate mounting between said first and second coupling elements and having first and second rotor coupling elements that cooperate respectively with said first and second shaft coupling elements.

2. The turbomachine according to claim 1, further comprising a second rotor disk connected to an overhanging end of said second shaft opposite to said electric rotor.

3. The turbomachine according to claim 1, wherein said electric machine comprises an electric motor, a generator or a motor/generator alternating machine.

4. The turbomachine according to claim 1, wherein said first and second couplings comprise dual-membrane couplings that permit axial equalization.

5. The turbomachine according to claim 1, wherein said first and second shafts have respective first and second mountings, each shaft and mounting forming a sealed module.

6. The turbomachine according to claim 1, wherein said mountings have high-precision roller bearings or gas-mounted bearing carriers.